CLAIMS

1. A pair of fluid flow plates comprising:

a first fluid flow plate comprising a plurality of first channels separated by first lands, and

a second fluid flow plate comprising a plurality of second channels separated by second lands, wherein at least one of said second lands has a cross sectional width wider than a cross sectional width of at least one of said first lands.

2. The pair of fluid flow plates according to claim 1 wherein said fluid plates are flow field plates for an electrochemical cell having anode and cathode sides, wherein said first fluid flow plate is for the cathode side, and said second fluid flow plate is for said anode side.

3. The pair of fluid flow plates according to claim 1 wherein a pitch of said second fluid flow plate is greater than a pitch of said first fluid flow plate.

4. The pair of fluid flow plates according to claim 1 wherein said first channels define a cross sectional width approximately equal to a cross sectional width defined by said second channels.

5. The pair of fluid flow plates according to claim 1 wherein said first lands are oriented at an angle α relative to said second lands in a plane parallel to said first flow field plate.

6. The pair of fluid flow plates according to claim 5 wherein the angle is from $0° \leq \alpha \leq 90°$.

7. The pair of fluid flow plates according to claim 1 wherein at least one of said first and second lands are provided in a wiggle alignment pattern.

8. The pair of fluid flow plates according to claim 1 wherein said first and second lands each have a wiggle alignment pattern, and each said wiggle alignment pattern is in phase respectively.

9. The pair of fluid flow plates according to claim 1 wherein said first and second lands each have a wiggle alignment pattern and each said wiggle alignment pattern is out of phase respectively.

10. The pair of fluid flow plates according to claim 1 wherein said first and second lands are each provided in a wiggle alignment pattern, and a pitch of said second fluid flow plate is larger than a pitch of said first fluid flow plate.

11. The pair of fluid flow plates according to claim 1 wherein said first and second channels are predominately straight.

12. The pair of fluid flow plates according to claim 7 wherein said first and second channels are serpentine.

13. A device comprising an electrochemical cell, said electrochemical cell comprising:

a membrane electrode assembly defining an anode side of said cell and a cathode side of said cell;

a first flow field plate for the cathode side of said cell, said first flow field plate comprising a plurality of first channels separated by first lands; and

a second flow field for the anode side of said cell, said second flow field plate comprising a plurality of second channels separated by second lands, wherein

said membrane electrode assembly is interposed between said first and second flow field plates, and

a pitch defined by said first flow field plate is less than a pitch defined by said second flow field plate.

14. The device according to claim 13 wherein the pitch defined by said second flow field plate is approximately twice as large as the pitch defined by said first flow field plate.

15. The device according to claim 13 wherein at least one of said second lands has a cross sectional width wider than a cross sectional width of at least one of said first lands.

16. The device according to claim 13 wherein said first channels define a cross sectional width approximately equal to a cross sectional width defined by said second channels.

17. The device according to claim 13 wherein a substantial number of said second lands define a cross sectional width greater than a cross sectional width defined by a substantial number of said first lands.

18. The device according to claim 13 wherein a substantial number of said second channels define a cross sectional width approximately equal to a cross sectional width defined by a substantial number of said first channels.

19. The device according to claim 13 wherein a majority of said second lands define a cross sectional width greater than a cross sectional width defined by a majority of said first lands.

20. The device according to claim 13 wherein a majority of said first channels define a cross sectional width approximately equal to a cross sectional width defined by a majority of said second channels.

21. The device according to claim 13 wherein substantially all of said second lands define a cross sectional width greater than a cross sectional width defined by substantially all of said first lands.

22. The device according to claim 13 wherein substantially all of said first channels define a cross sectional width approximately equal to a cross sectional width defined by substantially all of said second channels.

23. The device according to claim 13 wherein said first and second channels each have a cross sectional width of 1.5 mm or less.

24. The device according to claim 13 wherein each of said flow field plates have a thickness of 1 mm or less.

25. The device according to claim 13 wherein a cross sectional width of each said first lands is 1mm or less.

26. The device according to claim 13 wherein a cross sectional width of each said second lands is about 3 times wider than a cross sectional width of each said first lands.

27. The device according to claim 26 wherein said first channels define a cross sectional width approximately equal to a cross sectional width defined by said second channels.

28. The device according to claim 13 wherein said first and second channels are predominately straight.

29. The device according to claim 13 wherein said first and second channels each have a depth of about 1 mm or less.

30. The device according to claim 13 wherein the pitch defined by said first flow field plate is about 2.5 mm or less.

31. The device according to claim 13 wherein said device further comprises structure defining a fuel cell of the PEM-type.

32. The device according to claim 31 wherein said device further comprises structure defining a vehicle powered by said fuel cell.

33. The device according to claim 13 wherein said second lands are oriented at an angle to said first lands in a plane parallel to said second flow field plate.

34. The device according to claim 33 wherein said angle is in the range of 0° to 90°.

35. The device according to claim 13 wherein said first and second fluid flow plates lie in substantially parallel planes and said first channels, said first lands, said second channels, and said second lands define respective pitches that ensure at least about 30% land-to-land contact across a surface of a membrane interposed between said first and second flow field plates.

36. The device according to claim 35 wherein said respective pitches ensure at least about 30% land-to-land contact regardless of the manner in which said first lands are aligned relative to said second lands.

37. The device according to claim 13 wherein at least one of said first and second channels are formed with a multiple of alternating angles.

38. The device according to claim 13 wherein said first and second lands each have a wiggle alignment pattern, and each said wiggle alignment pattern is in phase respectively.

39. The device according to claim 13 wherein said first and second lands each have a wiggle alignment pattern and each said wiggle alignment pattern is out of phase respectively.

40. The device according to claims 13 wherein said first and second channels are predominately straight.

41. The device according to claims 13 wherein said first and second channels are serpentine.

42. A device comprising an electrochemical cell, said electrochemical cell comprising:

a membrane electrode assembly defining an anode side of said cell and a cathode side of said cell;

a first flow field plate for the cathode side of said cell, said first flow field plate comprising a plurality of first channels separated by first lands; and

a second flow field for the anode side of said cell, said second flow field plate comprising a plurality of second channels separated by second lands, wherein

said membrane electrode assembly is interposed between said first and second flow field plates,

said second channels define a cross sectional width approximately equal to a cross sectional width defined by said first channels,

said second flow field plate defines a channel pitch substantially greater than a channel pitch defined by said first flow field plate, and

at least said second lands are formed with a multiple of alternating angles relative to said first lands in a plane parallel to said second flow field plate and said respective channel pitches and cross-sectional widths ensure at least 30% land-to-land contact which is insensitive to plate-to-plate positioning.